

Serial No. 09/367,630

**In the Claims:**

1. Please amend claims 11 and 12 as shown in the enclosed marked-up copy of the amended claims;
2. Please leave claims 13/~~14~~ unchanged;
3. Please amend claims 15/~~17~~ and 19/~~22~~ as shown in the enclosed marked-up copy of the amended claims;
4. Please leave claims 23-~~24~~ unchanged;
5. Please cancel claim 30/~~31~~ without prejudice;
6. Please amend claims 31-~~33~~ as shown in the enclosed marked-up copy of the amended claims;
7. Please leave claims 34/~~35~~ unchanged;
8. Please amend claims 36-~~37~~ as shown in the enclosed marked-up copy of the amended claims;
9. Please leave claims 38-~~39~~ unchanged;
10. Please amend claim 40/~~41~~ as shown in the enclosed marked-up copy of the amended claims;
11. Please cancel claim 41/~~42~~ without prejudice;
12. Please amend claim 42/~~43~~ as shown in the enclosed marked-up copy of the amended claims; and
13. Please add new claims 43-~~49~~ as shown in the enclosed clean copy of the amended and new claims.

**In the Drawings:**

1. Please amend Figure 30 as shown in enclosed amended Figure 30 by changing the label "FIG. 30" to -- FIG. 30(a)--. Applicant submits with this response an amended Figure 30 for the Examiner's approval;
2. Please add new figures 30(a) through 30(f) as shown in enclosed Figures 30(b)-(f). Applicant submits new figures 30(b)-(f) for the Examiner's approval. Support for each of the new figures 30(b)-(f) is set forth below;
3. Please add new figure 47 as shown in enclosed Figure 47. Applicant submits new figure 47 for the Examiner's approval and the support for this figure is set forth below.

CLEAN COPY OF AMENDED AND NEW CLAIMS

11. (twice amended) A locking device comprising:

- (a) a locking mechanism for locking and unlocking movement of an object;
- (b) a pressure-based fingerprint sensor for detecting a fingerprint pattern comprising at least a portion of a plurality of ridges and a plurality of valleys of a finger in both an x-direction and a y-direction when said finger is pressed against said sensor;
- (c) a semiconductor memory device for storing registered fingerprint data;
- (d) a processor configured to determine by electronic processing whether the fingerprint data created from the fingerprint pattern detected by said fingerprint sensor matches with any of the registered fingerprint data stored in said semiconductor memory device;
- (e) a control unit for controlling whether said locking mechanism locks or unlocks movement of said object in response to said fingerprint match determination by said processor; and
- (f) a portable key unit separated from said locking mechanism, said portable key unit comprising one of the group consisting of: (1) said sensor, said semiconductor memory device, and said processor but not said control unit, (2) said sensor and said processor but not said semiconductor memory device and not said control unit, (3) said processor but not said sensor, not said semiconductor memory device, and not said control unit, (4) said sensor and said semiconductor memory device but not said processor and not said control unit, and (5) said semiconductor memory device, but not said sensor, not said processor, and not said control unit.

12. (twice amended) The locking device of claim 11 wherein said portable key unit comprises said sensor, said processor, and said semiconductor memory device but not said control unit.

15. (twice amended) The locking device of claim 11 wherein said portable key unit comprises said processor but not said sensor, not said semiconductor memory device, and not said control unit.

16. (twice amended) A locking device comprising:
- (a) a locking mechanism for locking and unlocking movement of an object;
  - (b) a pressure-based fingerprint sensor for detecting a fingerprint pattern comprising at least a portion of a plurality of ridges and a plurality of valleys of a finger in both an x-direction and a y-direction when said finger is pressed against said sensor;
  - (c) a semiconductor memory device for storing registered fingerprint data;
  - (d) a first processor configured to determine by electronic processing whether the fingerprint data created from the fingerprint pattern detected by said fingerprint sensor matches with any of the registered fingerprint data stored in said semiconductor memory device;
  - (f) a second processor in communication with said first processor and said semiconductor memory device, said second processor being configured to register an authorized person by storing in said semiconductor memory device fingerprint data created from said fingerprint pattern of said authorized person and detected by said sensor;
  - (e) a control unit for controlling whether said locking mechanism locks or unlocks movement of said object in response to said fingerprint match determination by said processor; and
  - (f) a portable key unit separated from said locking mechanism, said portable key unit comprising either (i) said first processor and said sensor but not said second processor, or (ii) said second processor and said sensor but not said first processor. (2)
17. (twice amended) The locking device of claim 11 wherein said portable key unit comprises said sensor and said processor but not said semiconductor memory device and not said control unit. (2)

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19. (twice amended) A switching device comprising:
- (a) a starting switch for starting operation of an object;

(b) a pressure-based fingerprint sensor for detecting a fingerprint pattern comprising at least a portion of a plurality of ridges and a plurality of valleys of a finger in both an x-direction and a y-direction when said finger is pressed against said sensor;

(c) a semiconductor memory device for storing registered fingerprint data;

(d) a processor configured to (1) determine by electronic processing whether the fingerprint data created from the fingerprint pattern detected by said sensor matched with any of the registered fingerprint data stored in said semiconductor memory device and (2) actuate said starting switch in response to said fingerprint match determination being positive; and

(e) a portable key unit separated from said starting switch, said portable key unit comprising one selected from the group consisting of: (1) said sensor, said semiconductor memory device, and said processor, (2) said sensor and said processor but not said semiconductor memory device, (3) said processor but not said sensor and not said semiconductor memory device, (4) said sensor and said semiconductor memory device but not said processor, and (5) said semiconductor memory device, but not said sensor and not said processor.

20. (twice amended) The switching device of claim 19 wherein said portable key unit comprises said semiconductor memory device but not said sensor and not said processor.

21. (twice amended) The switching device of claim 19 wherein said portable key unit comprises said sensor and said processor but not said semiconductor memory device. (2)

14 = 22. (amended) A switching device comprising:

(a) a starting switch for starting operation of an object;

(b) a pressure-based fingerprint sensor for detecting a fingerprint pattern comprising at least a portion of a plurality of ridges and a plurality of valleys of a finger in both an x-direction and a y-direction when said finger is pressed against said sensor;

(c) a semiconductor memory device for storing registered fingerprint data;

(d) a first processor configured to (1) determine by electronic processing whether the fingerprint data created from the fingerprint pattern detected by said sensor matched

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with any of the registered fingerprint data stored in said semiconductor memory device and (2) actuate said starting switch in response to said fingerprint match determination being positive;

(e) a second processor in communication with said first processor and said semiconductor memory device, said second processor being configured to register an authorized person by storing in said semiconductor memory device fingerprint data created from said fingerprint pattern of said authorized person and detected by said sensor; and

(f) a portable key unit separated from said starting switch, said portable key unit comprising either (i) said first processor and said sensor but not said second processor, or (ii) said second processor and said sensor but not said first processor.

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31. (amended) The switching device of claim 19 wherein said portable key unit comprises said sensor, said semiconductor memory device, and said processor.

32. (amended) A locking device comprising:

(a) a locking mechanism for locking and unlocking movement of an object;

- (b) a pressure-based fingerprint sensor for detecting a fingerprint pattern comprising at least a portion of a plurality of ridges and a plurality of valleys of a finger in both an x-direction and a y-direction when said finger is pressed against said sensor;
- (c) a plurality of semiconductor memory devices for storing registered fingerprint data;
- (d) a plurality of processors in communication with said plurality of semiconductor memory devices, said plurality of processors being configured to determine in parallel by electronic processing whether the fingerprint data created from the fingerprint pattern detected by said fingerprint sensor matches with any of the registered fingerprint data stored in said semiconductor memory devices;
- (e) a control unit for controlling whether said locking mechanism locks or unlocks movement of said object in response to said fingerprint match determination by said processor.

33. (amended) A locking device comprising:

- (a) a locking mechanism for locking and unlocking movement of an object;
- (b) a pressure-based fingerprint sensor for detecting a fingerprint pattern comprising at least a portion of a plurality of ridges and a plurality of valleys of a finger in both an x-direction and a y-direction when said finger is pressed against said sensor;
- (c) a semiconductor memory device for storing registered fingerprint data;
- (d) a processor configured to determine by electronic processing whether the fingerprint data created from the fingerprint pattern detected by said fingerprint sensor matches with any of the registered fingerprint data stored in said semiconductor memory device, said processor being further configured to make a negative fingerprint match determination if said fingerprint data created from the fingerprint pattern detected by said sensor perfectly matches any of said registered fingerprint data; and
- (e) a control unit for controlling whether said locking mechanism locks or unlocks movement of said object in response to said fingerprint match determination by said processor.

36. (amended) A switching device comprising:

- 33
- (a) a starting switch for starting operation of an object;
  - (b) a pressure-based fingerprint sensor for detecting a fingerprint pattern comprising at least a portion of a plurality of ridges and a plurality of valleys of a finger in both an x-direction and a y-direction when said finger is pressed against said sensor;
  - (c) a plurality of semiconductor memory devices for storing registered fingerprint data; and
  - (d) a plurality of processors configured to (1) determine in parallel by electronic processing whether the fingerprint data created from the fingerprint pattern detected by said sensor matched with any of the registered fingerprint data stored in said semiconductor memory devices and (2) actuate said starting switch in response to any of said fingerprint match determinations being positive.

33 = 37. (amended) A switching device comprising:

- (a) a starting switch for starting operation of an object;
- (b) a pressure-based fingerprint sensor for detecting a fingerprint pattern comprising at least a portion of a plurality of ridges and a plurality of valleys of a finger in both an x-direction and a y-direction when said finger is pressed against said sensor;
- (c) a semiconductor memory device for storing registered fingerprint data; and
- (d) a processor configured to (1) determine by electronic processing whether the fingerprint data created from the fingerprint pattern detected by said sensor matched with any of the registered fingerprint data stored in said semiconductor memory device, (2) make a negative fingerprint match determination if said fingerprint data created from the fingerprint pattern detected by said sensor perfectly matches any of said registered fingerprint data, and (3) actuate said starting switch in response to said fingerprint match determination being positive.

40. (amended) A lock and switch controlling system comprising:

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- (a) a locking mechanism for locking and unlocking movement of a first object;
  - (b) a starting switch in circuit with a second object, said starting switch being operable to connect or disconnect power to said second object;

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- (c) a control circuit for controlling whether said locking mechanism locks or unlocks movement of said first object;
  - (d) a semiconductor memory device for storing registered fingerprint data;
  - (e) a pressure-based fingerprint sensor for detecting a fingerprint pattern comprising at least a portion of a plurality of ridges and a plurality of valleys of a finger in both an x-direction and a y-direction when said finger is pressed against said sensor;
  - (f) a processor configured to (1) create sensed fingerprint data from said fingerprint pattern detected by said sensor, (2) determine whether a fingerprint match exists by comparing said sensed fingerprint data with said registered fingerprint data, and (3) actuate said control circuit in response to said fingerprint match determination being positive, said processor being in communication with said semiconductor memory device, said sensor, and said control circuit; and
  - (g) a portable key unit separated from said locking mechanism, said control circuit, and said starting switch, said portable key unit comprising said processor, said sensor, and said semiconductor memory device.

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42. (amended) The locking device of claim 11 wherein said portable key unit comprises said semiconductor memory device but not said sensor, not said processor, and not said control unit.

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ci  
c8

43. (new) The locking device of claim 11 wherein said portable key unit comprises said sensor and said semiconductor memory device, but not said processor and not said control unit. (4)

44. (new) The switching device of claim 19 wherein said portable key unit comprises said sensor and said semiconductor memory device but not said processor.

45. (new) The switching device of claim 19 wherein said portable key unit comprises said processor but not said sensor and not said semiconductor memory device. (3)



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46. (new) The locking device of claim 16 wherein said portable key unit comprises said first processor and said sensor but not said second processor. C  
match. regist 112, 157

47. (new) The locking device of claim 16 wherein said portable key unit comprises said second processor and said sensor but not said first processor. C  
regist matching

46 = 48. (new) The switching device of claim 22 wherein said portable key unit comprises said first processor and said sensor but not said second processor. C  
matching 112, 157

49. (new) The switching device of claim 22 wherein said portable key unit comprises said second processor and said sensor but not said first processor. C  
regist